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FLEXIBLE TIP TOOTHBRUSH HANDLE

Invention relates to toothbrushes and, in particular, to toothbrushes having an ergonomically designed handle.

There is an ongoing endeavor in the art to design toothbrushes which are more effective, easier to use, or more comfortable. An example is Patent No. 4,672,706 which discloses a handle of rectangular cross section twisted about its longitudinal axis to fit into the palm of a person's hand. However, the handle is essentially straight and made of a hard material.

In PCT application WO 96/21400, published January 10, 1995, there is disclosed a toothbrush having a curved end which is separately rotatable with respect to the portion of the handle accommodating the brush.

The present invention provides an improved toothbrush having a handle which is advantageous in providing good comfort to the palm of the hand when applying force at the end of the toothbrush.

In one aspect, the invention features a toothbrush comprising a handle member and a head member fixed to the proximal end of the handle member. The handle member is rigid at the proximal end that terminates with a head member comprising flexible bristles. The handle member is grippable by the user so that the flexible distal end in contact with the heel of the palm of the user may flex when force is applied by the user to the head member. The distal end is made of a flexible material, such as rubber, so that it will flex when pressure is applied. The flexible distal end is also easily gripped when made of a rubber material.

In another aspect, there are inserts on the handle member which are also made of a rubber material to facilitate the gripping of the handle between the thumb and index finger. Thus, the important areas of contact of the hand with the brush, which comprise the thumb, index finger and heel of the palm, are all in contact with a corresponding rubber portion on the brush handle member.

Other features and advantages of the invention will be apparent from the description of the preferred embodiment with reference to the accompanying drawings.

FIG. 1 is a perspective view of an embodiment of a toothbrush of the invention.

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the holder, depending on which way the bristles (14) are pointed. The rubberized, flexible portions 15, 16, 17 and 18 are preferably a thermoplastic elastomer (TPE). A typical useful elastomer is kraton rubber (a hydrogenated or unhydrogenerated oil-filled block copolymer of styrene and butadiene or isoprene having a shore A hardness in the range of about 5 to about 95. Other suitable materials include injection or reactive injection molded foams, rubber vulcanates and silicone vulcanates.

10 An advantage of the present invention is that when by gripping the hand 12 and/or by applying force at the head (13) against the interior of the oral cavity, an opposite force is applied at the distal end (15) of the toothbrush against the heel of the hand of the user. The flexible distal end not only eases the pressure of an otherwise hard surface against the hand but also flexes to accommodate the curvature of the heel of the hand. Accordingly, the toothbrush is ergonomically comfortable to the user.

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11. A method of using a toothbrush comprising a handle member having proximal and distal ends, and a head member affixed to said proximal end;

said head member comprising a brush and elongated neck portion connecting said brush to said proximal end of said handle member;

5 extension, comprising the steps of gripping in one hand said handle member and handle extension so that said flexible handle extension is in contact with the heel of the palm of said hand;

contacting said brush against the teeth or gums such that said flexible handle extension flexes when force is applied on said handle member.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/04587

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : A46B 5/02; A46B 9/04

US CL : 433/216; 15/167.1, 143.1

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 433/216; 15/167.1, 143.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,283,808 A (BEEBE) 18 August 1981, see entire document.	1,3
Y		4,7,9-11
Y	US 5,630,244 A (CHANG) 20 May 1997, see entire document.	1,2,5-9



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

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Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

RANDALL CHIN

Telephone No. (703) 308-0651

BRIAN A. HARDEN  
PARALEGAL SPECIALIST  
GROUP 700